Listing of Claims:

Claims 1 - 9 are all of the claims pending in the application after entry of this Amendment, wherein claims 1- 9 are currently amended.

1. (currently amended) A magnetic resonance imaging method comprising the steps of:

a.) generating magnetic resonance signals, having signal amplitudes and phases, by:

i.) producing a uniform magnetic field, utilizing a main coil system comprising a plurality of main coils to produce said uniform magnetic field;

ii.) generating RF excitation pulses, utilizing a transmission coil to generate said RF excitation pulses, such that said RF excitation pulses excite nuclear spins in an object that is to be imaged, which is residing within said uniform magnetic field;

iii.) terminating said RF excitation pulses to relax said nuclear spins and thereby emit magnetic resonance signals;

b.) ~~applying~~ generating temporary magnetic gradient fields, utilizing a plurality of gradient coils to generate said temporary magnetic gradient fields;

c.) superposing said temporary magnetic gradient fields on said uniform magnetic field to provide spatial encoding of the magnetic resonance signals being emitted;

d.) receiving said spatially encoded magnetic resonance signals, utilizing a receiving coil

e.) correcting ~~the~~ said signal amplitudes of ~~the~~ said spatially encoded magnetic resonance signals, or quantities calculated from said spatially encoded signal amplitudes for deviations that are due to spatial non-linearities of ~~the~~ said temporary magnetic gradient fields, utilizing correction means, to produce corrected magnetic resonance signals; and

~~applying an imaging pulse sequence after said steps of generating magnetic resonance signals and applying temporary magnetic gradient fields~~

f.) outputting said corrected magnetic resonance signals, utilizing output means, to form a magnetic resonance image.

2. (currently amended) ~~A~~ The magnetic resonance imaging method ~~as claimed in~~ according to claim 1, wherein ~~the correction of~~ correcting the signal amplitudes of the magnetic resonance signals is ~~calculated from the~~ performed based on spatial and ~~temporary~~ temporal characteristics of electrical current distribution through ~~a~~ said gradient ~~coil~~ coils.

3. (currently amended) ~~A~~ The magnetic resonance imaging method ~~as claimed in~~ according to claim 1, wherein ~~diffusion-weighted~~ said magnetic resonance signals are ~~generated~~ diffusion-weighted.

4. (currently amended) ~~A~~ The magnetic resonance imaging method ~~as claimed in~~ according to claim 3, wherein ~~the sequence of~~ said temporary magnetic gradient fields ~~includes~~ include a bipolar gradient pair.

5. (currently amended) ~~A~~ The magnetic resonance imaging method ~~as claimed in~~ according to claim 3, wherein ~~the sequence of~~ said temporary gradient fields ~~includes~~ include a pair of gradient pulses that have the same polarity and are separated by ~~an RF~~ a refocusing pulse.

6. (currently amended) ~~A~~ The magnetic resonance imaging method ~~as claimed in~~ according to claim 3, wherein the magnetic resonance imaging method is diffusion-related and a diffusion sensitivity ~~(B)~~ parameter (b) is a quantity calculated from said amplitudes of said magnetic

resonance signals, which is corrected for deviations that are due to spatial non-linearities of the temporary magnetic gradient fields.

7. (currently amended) ~~A~~ The magnetic resonance imaging method ~~as claimed in~~ according to claim 1, wherein the ~~sequence of temporary gradient fields provides flow sensitivity, and~~ magnetic resonance imaging method is flow-related and a flow sensitivity parameter (Q) is a quantity ~~is derived~~ calculated from ~~the~~ said amplitudes of said magnetic resonance signals, ~~and the flow quantity~~ which is corrected for deviations that are due to spatial non-linearities of the temporary magnetic gradient fields.

8. (currently amended) A magnetic resonance imaging system comprising:

a.) means for generating magnetic resonance signals, having signal amplitudes and phases, said means including:

i.) means for producing a uniform magnetic field, and

ii.) means for alternatively generating and terminating RF excitation pulses to excite nuclear spins in an object being imaged, residing within said uniform magnetic field, thereby causing the emission of magnetic resonance signals;

b.) means for ~~applying~~ generating temporary magnetic gradient fields~~,~~ and superposing them on said uniform magnetic field to spatially encode said magnetic resonance signals being emitted, thereby producing spatially encoded magnetic resonance signals;

c.) means for receiving said spatially encoded magnetic resonance signals;

d.) means for correcting ~~the~~ said signal amplitudes of ~~the~~ said magnetic resonance signals, or quantitiescalculated from ~~the~~ said signal amplitudes, for deviations that are due to spatial non-linearities of ~~the~~ said temporary magnetic gradient fields, to produce corrected magnetic resonance signals; and

~~means for applying an imaging pulse sequence after the magnetic resonance signals are generated and the temporary magnetic gradient fields are applied~~

e.) means for outputting said corrected magnetic resonance signals and forming a magnetic resonance image therefrom.

9. (currently amended) A computer-readable medium storing a computer program with computer executable instructions for performing the steps of:

a.) generating magnetic resonance signals in a magnetic resonance imaging system, said magnetic resonance signals having signal amplitudes and phases, by:

i.) producing a uniform magnetic field, utilizing a main coil system comprising a plurality of main coils to produce said uniform magnetic field;

ii.) generating RF excitation pulses, utilizing a transmission coil to generate said RF excitation pulses, such that said RF excitation pulses excite nuclear spins in an object that is to be imaged, which is residing within said uniform magnetic field;

iii.) terminating said RF excitation pulses to relax said nuclear spins and thereby emit magnetic resonance signals;

b.) ~~applying~~ generating temporary magnetic gradient fields in ~~the~~ said magnetic resonance system, utilizing a plurality of gradient coils to generate said temporary magnetic gradient fields;

c.) superposing said temporary magnetic gradient fields on said uniform magnetic field to provide spatial encoding of the magnetic resonance signals being emitted;

d.) receiving said spatially encoded magnetic resonance signals, utilizing a receiving coil

e.) correcting ~~the~~ said signal amplitudes of ~~the~~ said spatially encoded magnetic resonance signals, or quantities calculated from said spatially encoded signal amplitudes for deviations that are due to spatial non-linearities of ~~the~~ said temporary magnetic gradient fields, utilizing correction means, to produce corrected magnetic resonance signals; and

~~applying an imaging pulse sequence in the magnetic resonance system after said steps of generating magnetic resonance signals and applying temporary magnetic gradient fields~~

f.) outputting said corrected magnetic resonance signals, utilizing output means, to form a magnetic resonance image.